

**Formaldehyde Levels in FEMA-Supplied Trailers**  
**Preliminary Findings from the Centers for Disease Control and Prevention**  
**February 14, 2008**

**Background**

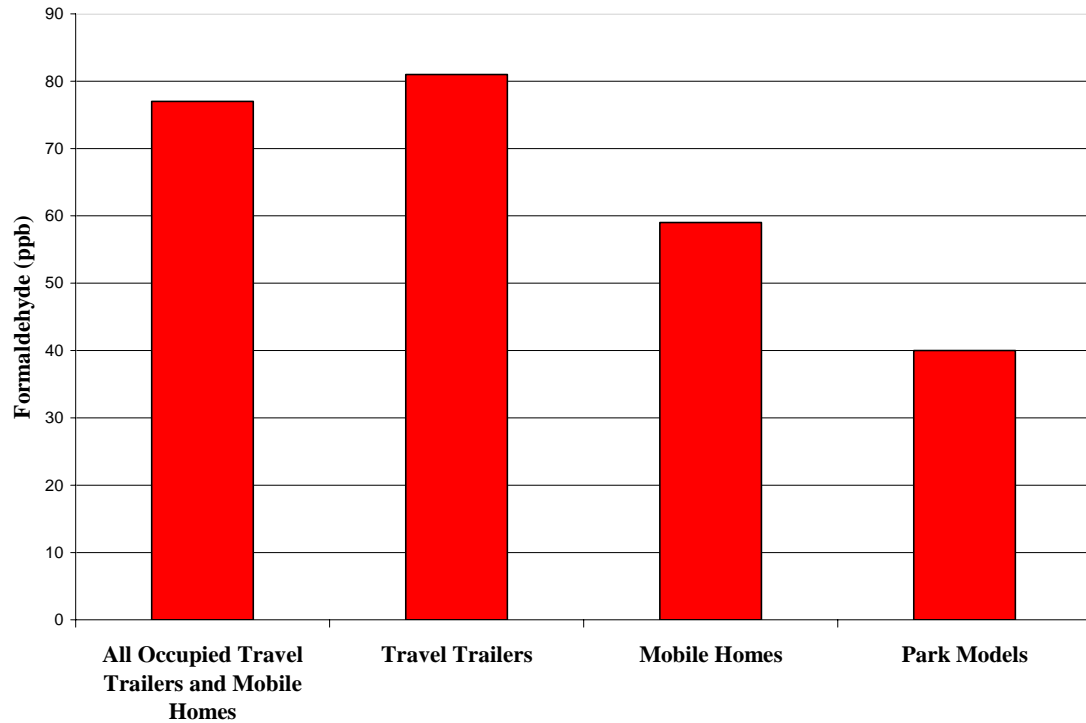
From December 21, 2007, to January 23, 2008, the Centers for Disease Control and Prevention (CDC) conducted testing to assess levels of formaldehyde in indoor air of occupied travel trailers, park models, and mobile homes supplied by the Federal Emergency Management Agency (FEMA) as temporary housing for displaced residents of the US Gulf Coast Region following Hurricanes Katrina and Rita.

The testing was one of several actions CDC initiated in response to a request from FEMA to investigate concerns about formaldehyde in occupied FEMA trailers in Louisiana and Mississippi. CDC randomly selected 519 trailers for testing from FEMA's database of all existing occupied trailers. These results represent only that group. These 519 trailers represent a cross-section of the most frequently used trailer types and manufacturers. CDC has done preliminary analysis of the data from the testing and has identified preliminary findings with significant implications for public health.

**Key Findings**

- In many trailers, mobile homes, and park models tested, formaldehyde levels were elevated relative to typical levels of US indoor exposure.
- Average levels of formaldehyde in all units was about 77 parts per billion (ppb). This level is higher than US background levels. Levels measured ranged from 3 ppb to 590 ppb.
- These measured levels are likely to under-represent long-term exposures since formaldehyde levels tend to be higher in newer travel trailers and mobile homes and during warmer weather.
- Indoor temperature was a significant factor for formaldehyde levels in this study independent of trailer make or model.
- Formaldehyde levels varied by model (mobile homes, park homes, and travel trailers), but all types of trailers tested had some high levels.
- At the levels seen in many trailers, health could be affected.

## Geometric Mean Formaldehyde Levels in Occupied FEMA Travel Trailers and Mobile Homes



## Interpreting Formaldehyde Levels in Indoor Air

1000		If your reading falls into the <b>higher range</b> , you need to place a high priority on lowering your exposure to formaldehyde. This is especially important if residents of your trailer are elderly, young children, or have health conditions, such as asthma.
100		If your reading falls into the <b>intermediate range</b> , your risk of irritation from formaldehyde exposure is lower, but it is still important to take steps to reduce your formaldehyde exposure. This is especially important if residents of your trailer are elderly, young children, or have health conditions such as asthma.
10		If your reading falls into the <b>lower range</b> , these levels are found on the streets of many cities and in many buildings. The risk of health problems at these levels is low.
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Note: Levels are expressed at parts per billion (ppb). To convert to parts per million (ppm), divide by 1000.

### **Recommendations for Public Health Officials**

- These conclusions support the need to move quickly to relocate trailer residents before the warmer weather of summer, placing highest priority on those who are symptomatic and/or especially vulnerable.
- Appropriate follow-up will require multi-agency collaboration including FEMA, HUD, CDC, and others, to achieve safe, healthy housing for people displaced by Hurricanes Katrina and Rita who continue to live in FEMA-supplied travel trailers and mobile homes.
- FEMA should consider necessary assistance to Louisiana and Mississippi Health Departments to ensure adequate follow-up, including medical needs, for trailer residents with health and medical concerns resulting from residence in FEMA-supplied travel trailers or mobile homes and formaldehyde exposure.
- FEMA should consider establishing a registry and long-term health monitoring of children and others who resided in FEMA-supplied travel trailers and mobile homes in the Gulf Coast Region.

### **Recommendations for Residents**

- Families who live in FEMA-supplied travel trailers and mobile homes should spend as much time outdoors in fresh air as possible.
- Open windows as much as possible to let in fresh air.
- Try to maintain the temperature inside travel trailers and mobile homes at the lowest comfortable level.
- Do not smoke, and especially do not smoke indoors.
- If you have health concerns, see a doctor or another medical professional.
- Families that include children, the elderly, and those with chronic diseases such as asthma should make a special effort to get as much fresh air as possible, and these families should make relocating to permanent housing a priority.

### **Further CDC Action**

- A team composed of a U.S. Public Health Service (USPHS) Commissioned Corps officer and a FEMA representative will begin notifying participants in the study on February 21, 2008, with personal visits and a hand-delivered letter. The Commissioned Corps took on this work at the request of CDC.
- CDC will conduct public availability sessions in both Louisiana and Mississippi to provide information to other concerned and interested individuals.
- CDC's 24-hour, toll-free hotline will continue to respond to health-related questions from residents.
- Other factors may affect formaldehyde levels, and CDC continues to analyze the data to assess these factors. A final report on this exposure assessment is expected later in the spring.
- CDC is continuing several studies of unoccupied trailers to assess formaldehyde levels across different models and types and to identify factors that reduce or raise those levels. This also involves identifying cost-effective ways to reduce formaldehyde levels and concentrations in trailers.
- CDC is developing a protocol for a long-term study of children who resided in FEMA-supplied travel trailers and mobile homes in Mississippi and Louisiana.
- CDC is providing educational materials and information to trailer residents about their risk of exposure to formaldehyde and ways to improve indoor air quality and health.
- CDC will reconvene the panel of experts to identify and advise on health issues that could be associated with long-term residence in temporary housing units, such as travel trailers.